

Vesico-Ureteral Reflux  
(VUR) in children  
Patient/parents brochure

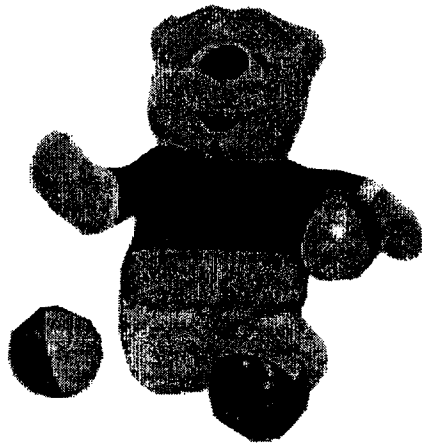


# Deflux® patient/parents brochure

## Introduction

*In this brochure you will learn more about Vesico-Ureteral Reflux (VUR) in children. VUR means that urine from the urinary bladder flows up and back towards the kidneys. You will also learn more about the various treatment alternatives for children with VUR, and in particular about the effectiveness of endoscopic treatment with Deflux®.*

*You will also find the answers to some questions that parents of children with VUR often wonder about.*



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## What is vesico-ureteral reflux (VUR) in children?

Vesico-Ureteral Reflux, VUR, means that there is a backflow ('reflux') of urine from the bladder to the kidneys. Normally, this should not happen. The urine should only leave the bladder by the normal route via the urethra when the child urinates.

In Vesico-Ureteral Reflux, VUR, the anti-backflow 'valve' that ought to prevent the urine from flowing the wrong way does not work and the urine flows backwards from the bladder towards the kidney.

By testing (using X-rays) to see, how much urine flows backwards, the reflux can be graded on a scale between one and five. Grade one represents the mildest form of reflux and grade five represents the most severe reflux. With severe reflux, the urine flows a long way back up the ureters, as far as the kidneys. With a milder reflux, the urine that flows back does not go as far.

If the urine is infected when it refluxes, there is a risk that the kidneys may be damaged. This can then cause inflammation of the outlets from the kidneys and kidney scarring. In a small percentage of cases, reflux has been the cause of such serious damage to the kidneys that dialysis has been necessary in later life.

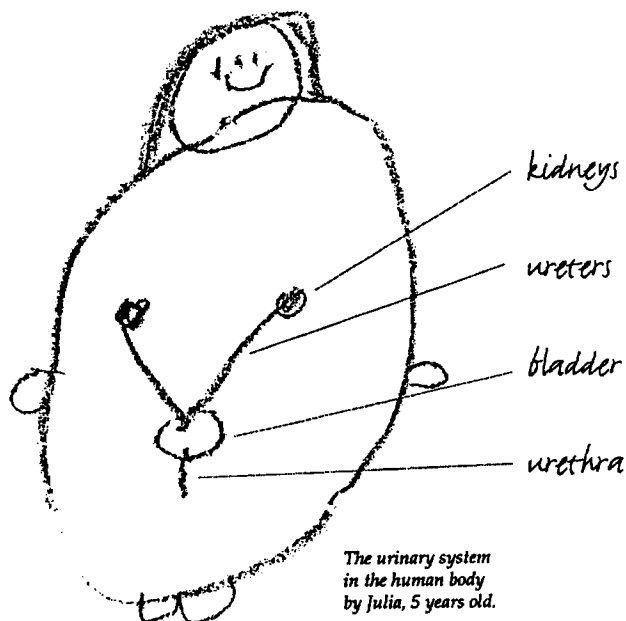
VUR is a defect that in many cases cures itself as the child grows up and the 'valve' function in the bladder matures. But even though reflux often cures itself, it is important that the child is examined, and that proper treatment is considered.

## How is VUR diagnosed?

VUR is often diagnosed when a child has suffered from recurring urinary tract infections. VUR contributes to these repeated infections by making it easier for bacteria that gets into the bladder to go up to the kidneys. When the infection is diagnosed the child is given antibiotics to cure the continuing infection. Even when the infection has passed, the child continues on antibiotics to prevent new infections while waiting until the reflux can be treated.

There are various ways of treating children who have VUR. The first step in all treatment methods is to assess how serious the reflux is – to assign the reflux a grade. This assessment is done by tests given at the hospital.

The primary means of assessing reflux grade is through voiding cystourethrography ("VUCG"). A contrast agent (a type of X-ray sensitive dye) is injected into the bladder. An X-ray of the bladder is then taken. With this X-ray, it is possible to judge how much urine is flowing back up the ureters and to survey the urinary passages. Other tests may also be needed to check kidney function, such as viewing the inside of the bladder with a cystoscope – a miniature viewing device.



## What are the different treatment alternatives?

Today there are three different ways of treating VUR: antibiotic treatment, open surgery, and endoscopic treatment.

### Antibiotic treatment

One risk with VUR is that the kidneys may be damaged if the urine that flows back is infected.

One treatment option is to give the child antibiotics to prevent urinary tract infections.

Antibiotic treatments may continue for several years and require the child to take medicine on a daily basis. The treatments call for the active participation of the parents since the child must take his/her medicine every day. Long-term treatment with antibiotics can result in infections from bacteria that are resistant to antibiotic treatment, and the child may get new urinary tract infections in spite of taking the medicine. Even with long-term medication, the reflux and the accompanying risks of new infections and damage to the kidneys, still exists.

The treatment continues until tests show that the reflux has been cured as the child grows and the 'valve' function matures.

### Open surgery

One treatment method is a surgical procedure that alters the location of the ureters (the tube between the bladder and the kidneys) so that they open into the bladder in a way that makes it less likely that urine will reflux. The anti-backflow 'valve' then works again.

Open surgery has good results, and the vast majority of children are completely cured of their reflux. However the operation is stressful for the child, who suffers pain after the operation. For some days after the operation the child needs to have catheters before the child can urinate on his or her own. After the operation the child needs to stay in the hospital for five to seven days, and rest for one week after returning home.

## Endoscopic treatment

Endoscopic treatment means that a cystoscope – a miniature viewing device – is inserted into the bladder through the urethra. A material is then injected into the mucous membrane of the bladder at the locations where the ureters enter the bladder. A little bulge is formed which makes it harder for the urine to flow backwards. The bulge also makes the openings from ureters into the bladder smaller, which again makes it harder for the urine to flow back. The openings are still large enough for the urine to flow down into the bladder without any problem.

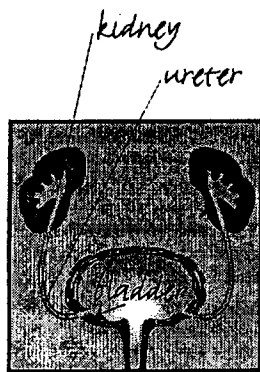


Fig. 1. Arrow shows injection site.

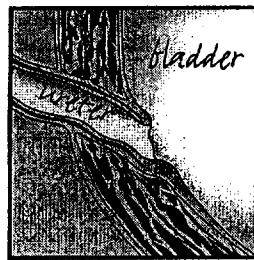


Fig. 2. Close up view of where the ureter enters the bladder.

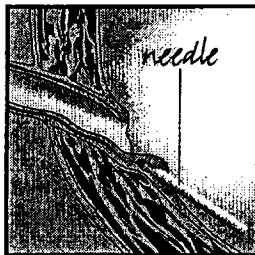


Fig. 3. A material is injected into the mucous membrane of the bladder at the locations where the ureters enter the bladder.

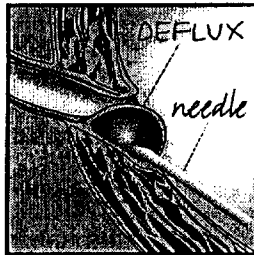


Fig. 4. A little bulge is formed which makes it harder for the urine to flow backwards.

The treatment consists of an examination, an endoscope procedure and post treatment recovery and examination. The endoscope procedure takes only 30 minutes, and the entire treatment is completed in less than a day.

The child can usually go home the same day. Once home, further medical care is generally not needed and the child can go back to ordinary activities. After about three months the child is reexamined (using X-ray). If the 'bulge' needs to be enlarged, further injections can be given. If the reflux has diminished sufficiently or disappeared, no further treatment is needed.

Endoscopic treatment can eliminate a child's reflux at an early stage. The child does not need prolonged antibiotic treatment while waiting for either open surgery, or for the reflux to resolve on its own. Endoscopic treatment gives immediate results.

Endoscopic treatment is most suitable for reflux grades II-IV. Grade I reflux is less serious than higher grades, and is generally treatable by more conservative therapies (such as antibiotics). Grade V is the most serious grade of reflux, and based on clinical studies, is not typically cured with endoscopic treatment. Many doctors treat grade V reflux through open surgery.

In the USA only one material is currently available for endoscopic treatment of VUR - Deflux®.

Risks associated with endoscopic treatment include mild bleeding in the urinary tract, infection, and blockage of the ureter (if too much Deflux® is injected). For more information on risks, ask your doctor.

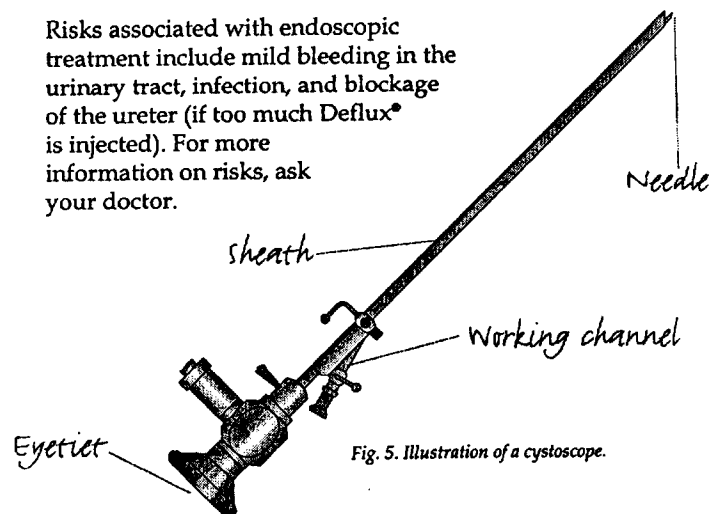


Fig. 5. Illustration of a cystoscope.

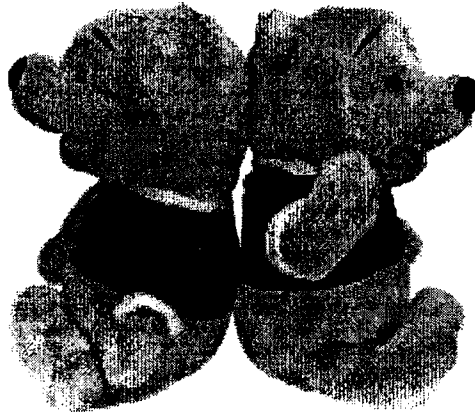


## What is Deflux®?

Deflux® has been approved in Europe since 1998. Up to now, more than 2,000 patients have been given endoscopic treatment using Deflux®. In the US Deflux® has been approved for treating children with reflux grades II-IV.

Deflux® consists of two types of cross-linked polysaccharides, both of them are well known. One of them (dextranomer) has for example been used in wound treatments for more than 30 years. The other polysaccharide is called hyaluronic acid and is present in most body tissues. The hyaluronic acid part of Deflux® is a chemical that is naturally found in the body, and is quickly broken down. The dextranomer part of Deflux® then remains, and is surrounded by the body's own tissues. The dextranomer forms a 'bulge' that remains behind to help correct the VUR, and the treatment continues to give effect.

The polysaccharides used in Deflux® are not made from animals and are extremely pure because they are bio-synthetically produced in the laboratory. Therefore, there is no risk of disease or allergic reactions due to animal components.



## Clinical information

### Indication

Deflux® is an injectable gel that is used in the bladder to stop urine backflow from the bladder to the kidneys in children with a condition known as Vesico-Ureteral Reflux (or VUR).

### Contraindications

Children with any of the following conditions should not be treated with Deflux®:

- Non-functional kidney(s)
- Hutch diverticuli
- Duplicated ureters
- Acute voiding dysfunction
- Ongoing urinary tract infection

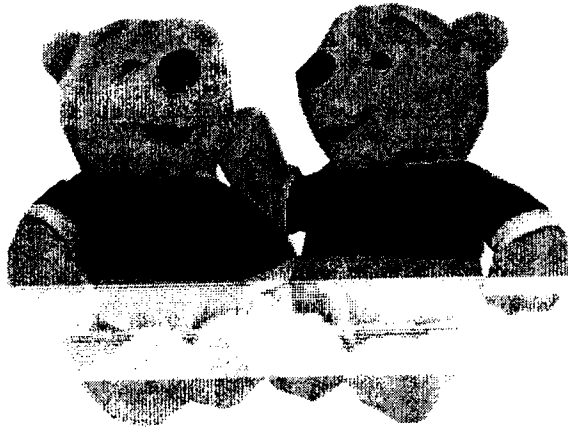
The physician will evaluate the patient for the presence of these conditions. These conditions either cause Deflux® treatment to be ineffective, or cause serious infection. Ask your physician if you have any questions about whether your child might have any of these conditions, or about how these conditions affect the use of Deflux®.

### Warnings

Inform your doctor if your child has an ongoing urinary tract infection (UTI). UTIs are common for VUR patients. Patients who suffer from a UTI should not be treated with Deflux® until the infection has resolved. If treatment is performed with ongoing UTI, the area where the product is injected may become infected.

## Precautions

Contact the hospital if your child does not want to urinate, feels pain in his or her abdomen or runs a temperature after returning home. Such symptoms could be the result of a blockage in the ureters (caused by the bulge of Deflux® being too large). These blockages can damage the kidneys, and can be detected by taking a blood sample and an ultrasound scan.



## Adverse events

There is a small risk of infection and bleeding as a result of the injection procedure if your child is injected with Deflux®.

Doctors used clinical trials to see how useful and safe Deflux® was. In these trials, minor enlargement of the ureters was seen in about 3 out of 100 children. This could have been caused by doctors injecting too much Deflux® in the ureters. The ureters in most of these children got better without treatment. About 15 out of 100 children had urinary tract infections during the trials. The Deflux® injections did not stop the reflux in these children. Rather, doctors treated the infections with medicines.

## Clinical trial results

Doctors used three clinical trials to test Deflux®. One year after treatment, about six of ten children no longer had reflux. An additional two out of ten children had reduced reflux and did not need any more treatment. So, only about two out of ten children will likely not be helped by this procedure. This procedure seems to work better for children who have grades II and III reflux. It does not seem to work as well for children who have grade IV reflux. Also, the procedure seems to work better for children who have reflux in only one ureter.

Children seem to stay cured after the procedure. After 3 years, five to six children out of ten stay free of reflux.

## How is endoscopic treatment with Deflux® carried out?

Endoscopic treatment of VUR is carried out in hospital, but both parents and children can usually return home the same day. Your child is given a short general anesthesia and will be asleep during the treatment to ensure that he/she remains calm and that the procedure is as simple and easy as possible. Endoscopic treatment does not produce any visible scar.

The endoscope procedure takes only about 30 minutes. The surgeon uses a cystoscope – a miniature viewing device – that is inserted into the bladder through the urethra. Inside the bladder, the surgeon locates the places where the ureters enter. With the help of a syringe, Deflux® is injected into the mucous membrane, and a little 'bulge' immediately forms. This little bulge acts as a strengthened anti-backflow 'valve' that makes it harder for the urine to flow back through the ureters towards the kidneys.

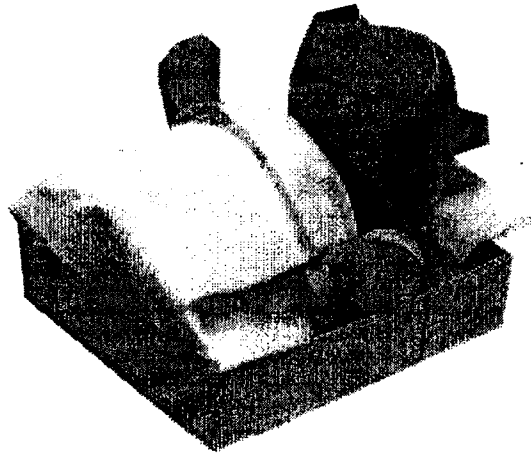
Just like adults, some children waking after anesthesia may feel a little confused and dizzy, while others may feel awake and alert right away. Generally there is no pain after the treatment, with the possible exception of some pain the first few times your child urinates. Before your child and you go home it is important that your child is fully awake and that your child has urinated once.

After three months or so, another VCUG is taken which shows whether the reflux remains. If the 'bulge' needs to be reinforced, further treatments are carried out. Many children are cured of their reflux after the first treatment. Some children may need some further treatment.

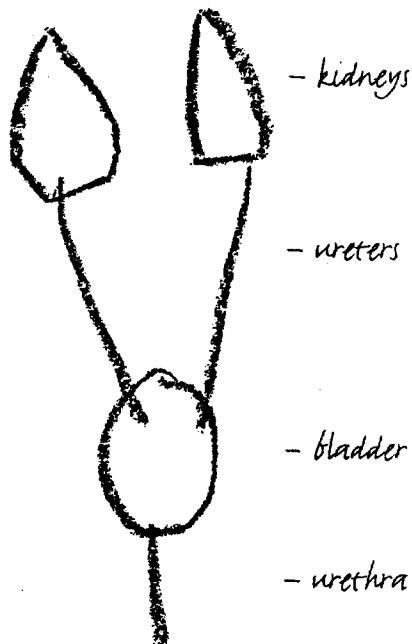
## Preparing the child

When it is time for the child to undergo an endoscopic treatment with Deflux®, it is usually better if the child knows something of what is going to happen. Coming into the hospital environment may be a new experience for the child. So to be prepared often reduces the stress for the child. It is best to explain in your own words what is going to happen. The following may help. It is important that you use the same words for 'urine' and 'urinate' that you normally use with your child at home.

"Your bladder is like a big balloon that fills up with urine that comes from the kidneys. When you urinate, you empty the bladder, which then has nothing left in it. The urine comes into the bladder down two tubes, which are rather like two long, thin drinking straws. When the bladder is full with urine, two little gates are supposed to shut off the tubes. If they don't work properly, the urine can run back up the tubes. This is not good for you, because the kidneys may become sick if there are germs in the urine."



"To stop the urine from running back to the kidneys, the doctor can take a tiny little viewer and look right inside your bladder – inside the big balloon. Then from the viewer he can put a little blob of jelly inside you to stop the urine from running backwards to the kidneys. But the urine that should run down into the bladder and then comes out when you urinate still comes down as usual. The doctor looks inside your bladder through the little hole where the urine comes out when you urinate. When the doctor looks inside and puts the little blob of jelly in, you have to go to sleep for a while. But that won't happen unless you have an injection with a medicine that makes you go to sleep for a little while. Then you wake up again once the doctor has finished."



*The urinary system  
by Julia, 5 years old.*

## Questions and answers about VUR and endoscopic treatment with Deflux®

### **What is vesico-ureteral reflux, VUR?**

Vesico-ureteral reflux, VUR, means that there is a backflow (reflux) of urine from the bladder towards the kidneys.

### **How do you know whether a child has VUR?**

The commonest indication that a child has VUR is that he or she suffers from recurring urinary tract infections. VUR contributes to these repeated infections by making it easier for bacteria that get into the bladder to go up to the kidneys. If this is the case it is necessary to confirm whether the child has VUR or not and tests must be carried out at the hospital.

### **What causes VUR?**

A few children, about one in every 100, have reflux. For some of these few children, reflux started at birth and was caused by an unusual connection between the ureters and bladder. For others, reflux may have been caused by abnormal urinating.

### **How common is VUR?**

About 1 in every 100 children have VUR. Of these, about half require treatment.



**What happens if the reflux is not treated?**

Recurring urinary tract infections in combination with VUR may cause damage to the kidneys.

The consequences can include inflammation of the outlets from the kidneys, and kidney scarring. In a small percentage of cases, urinary tract infections and reflux have been the cause of such serious damage to the kidneys that dialysis has been necessary in later life.

**Is reflux hereditary?**

Yes, reflux may be hereditary.

**Is reflux always dangerous?**

No, the main risk associated with VUR is that the ureters and kidneys may be damaged if the urine that flows back the wrong way is infected.

**How do you know if the child has a mild or severe reflux?**

By means of tests at the hospital such as VCUG, an X-ray using a contrast medium, which show how far up towards the kidneys the urine is refluxing.

**How is an endoscopic treatment with Deflux® carried out?**

Endoscopic treatment means that a cystoscope – a miniature viewing device – is inserted into the bladder through the urethra. A material is injected into the mucous membrane of the bladder at the locations where the ureters enter the bladder. A little 'bulge' is formed which makes it harder for the urine to flow backwards. The treatment takes only 30 minutes and the child can normally go home the same day. Once home, further medical care is generally not needed and the child can go back to ordinary activities the next day.

**Is Deflux® dangerous?**

There is a very low risk of Deflux® migrating to other parts of the body. The Deflux® injection procedure forms no scar. Since Deflux® is produced bio-synthetically, there is an extremely low risk of transmission of diseases. As with any procedure involving an X-ray, there is a slight risk to the VCUG procedure that is used to diagnose reflux.

The use of Deflux® has some potential risks. These include mild bleeding, infection, and blockage of the ureter (if too much Deflux® is injected). For more information on these risks, ask your doctor.

**Will the child be cured?**

The chances are good that the child will be cured. Tests carried out one year after treatment show that six out of ten children were completely cured of their reflux, and an additional two out of ten children had their reflux diminished to the extent that no further treatment was needed.

Children with grades II and III reflux respond to Deflux® treatment somewhat better than children with grade IV reflux. Also, children with reflux in only one ureter respond better than those with reflux in both ureters.

**Will the child be put to sleep during the treatment?**

Yes, the child is given a short general anesthesia and will be asleep during the treatment to ensure that he/she remains calm and that the procedure is as simple and easy as possible.

**Can the treatment be repeated?**

Yes, several attempts can be made to build up a 'bulge' to reduce the child's reflux. In clinical studies, approximately two out of ten patients needed to have a repeat treatment.

**When can a new treatment be carried out?**

If treatment needs to be repeated, it can be done as soon as it is convenient for the child and the hospital where the treatment is to be done.

**When can medication be stopped?**

Three months after treatment, another VCUG is taken to see if the reflux has disappeared or if the 'bulge' needs to be reinforced with further treatment. If the reflux has completely ceased or diminished to an extent that no further treatment is required, the child can stop taking medication.

**How can the 'bulge' stay in place if the Deflux® material breaks down and leaves the body?**

The hyaluronic acid part of Deflux® is a chemical that naturally occurs in the body, and is quickly broken down. The dextranomer part of Deflux® then remains, and is surrounded by the body's own tissues. The dextranomer forms a 'bulge' that remains behind to help correct the VUR, and the treatment continues to give effect.

Long-term data indicated that approximately five or six children out of ten treated with Deflux® remained cured 3 years after treatment.

## GLOSSARY

<b>Adverse event</b>	An undesirable event occurring during the use of a medicine or a medical device.
<b>Anesthesia</b>	Temporary loss of feeling caused by administration of a drug.
<b>Bladder</b>	A muscular organ in the belly where urine is stored.
<b>Bulge</b>	The injected material creates a little blob of jelly in the mucous membrane – a “bulge”.
<b>Catheter</b>	A sterile, soft rubber tube that is inserted into the bladder, through the urethra to drain urine.
<b>Clinical trials</b>	Investigations in humans to find out the efficacy or safety of medical drugs or devices.
<b>Contraindications</b>	Alerts the user to situations where the product should not be used because the risk of using the product outweighs the benefits.
<b>Cystoscope</b>	A miniature viewing device, that is inserted through the urethra to allow the physician to look inside the bladder and internal urethra.

<b>Dialysis</b>	The kidneys are the body's way of cleaning the blood. Dialysis is a medical procedure that is used if the kidneys stop working properly. A machine is used to mechanically take the place of the kidneys, and remove waste products from the blood.
<b>Endoscopic treatment</b>	Injection of a material into the mucous membrane of the bladder using an endoscope (such as a cystoscope), to create a "bulge" that makes it harder for the urine to flow back to the kidneys.
<b>Hutch diverticuli</b>	Sacs or pouches in the walls of the ureters.
<b>Kidney</b>	An organ in the flank that filters the blood to form urine which is passed to the bladder for storage.
<b>Mucous membrane</b>	The thin surface of an organ such as the bladder.
<b>Polysaccharides</b>	Complex molecules that consist of several individual sugar molecules (or monosaccharides) that are joined together.
<b>Precautions</b>	Alerts the user to exercise special care necessary for the safe and effective use of the product.
<b>Resistant</b>	Lack of sensitivity to an antibiotic.

<b>Ureter</b>	One of two tubes carrying urine from the kidneys to the bladder.
<b>Urethra</b>	The tube leading the urine out from the bladder.
<b>VCUG</b>	Voiding cystourethrography, a technique used to assess the grade of VUR. A contrast agent (a type of X-ray sensitive dye) is injected into the bladder. An X-ray of the bladder is then taken. With this X-ray, it is possible to judge how much urine is flowing back up the ureters and to survey the urinary passages.
<b>VUR</b>	Vesico-Ureteral Reflux means backflow of urine from the bladder to the kidneys.
<b>Warning</b>	Alerts the user to potential serious outcomes.

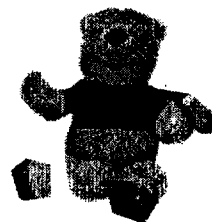
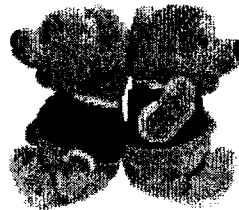
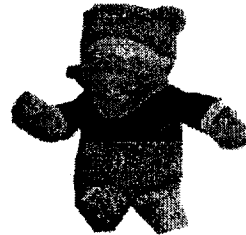
### More information

would you like to know more about Vesico-Ureteral Reflux, VUR in children?

You will find more information at  
[www.deflux.com](http://www.deflux.com)

Toll free telephone number:  
XXX

*Here you can draw your own teddybear!*



# Deflux

natural & safe

Deflux® by Q-Med AB, Sweden

## Q-MED

creating well-being

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